epiphan video
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User Guide

AV.io HD

Thank you for choosing Epiphan Video!

At Epiphan Video, product function and quality are our top priority. We make every effort to make sure that our products exceed your expectations.

Product feedback

Your feedback is important! We regularly contact our customers to ensure our products meet your performance and reliability requirements. We strive to continually enhance our products to accommodate your needs. Please let us know how you think we can improve our products by emailing your suggestions to info@epiphan.com.

Specifications

Go to the USB Video Grabbers page of the Epiphan website to get the most recent product specifications and additional information about Epiphan AV.io HD.

Warranty

All Epiphan Video products are provided with a 100% return to depot warranty for one year from the date of purchase.

Technical support

Epiphan's products are backed by our professional support team. If you are having issues with your product, please gather details about your system and contact our team by:

- E-mailing support@epiphan.com
- Live chat via the link on our support site http://www.epiphan.com/support/
- Phone toll free at 1-877-599-6581 or call +1 613-599-6581

Be sure to include as much information about your problem as possible, including:

- Problem description
- Details of the video or audio source (type, resolution, refresh rate, etc.)
- Product serial number
- Your operating system and version number

Table of contents

Introducing AV.io HD!

Epiphan's AV.io HD is a new video grabber – the first of its kind in Epiphan's family of Grab & Go video capture hardware!

AV.io HD provides cross-platform, high-definition video capture. It is portable, flexible, and simple to use: the perfect companion to your HD video source! Best of all, there's no installation required! Simply connect the required cables and you're ready to start capturing live HD video content with your favourite third-party application!

Product Features

Simplicity of use

AV.io HD has no driver to install and is ready to capture right out of the box! This is because AV.io HD is a UVC-capture device, which means it works automatically with existing drivers on your operating system – just like a webcam!

HD video capture

Looking for quality video capture? Look no further! Use AV.io HD to capture from HDMI (with HDMI audio), DVI or VGA sources in Full HD at 60 fps!

Automated capture configuration

AV.io HD works *automatically* with all resolutions up to 1080p and also resizes video and resamples audio outputs on your behalf for a worry-free and seamless video capture experience without any configuration required!

Extensive third-party support

AV.io HD works with UVC-friendly applications including Skype, VLC media player, Wirecast, Adobe FMLE and *many* more!

Limitations and Known Issues

This section includes known issues or limitations that affect functionality or usability and ways that you can work around these limitations.

- AV.io HD is not a selectable device when attempting to capture on Mac using VLC media player (this is a VLC-specific bug).

    Workaround: Upgrade to an older version of VLC media player (ex: 2.1) or use a different capture application.

- On Windows 7, when AV.io HD is connected to the video source and capture computer, the AV.io Config tool displays the device more than once in the device list.

  Workaround: Press the refresh icon to refresh the device list; only one AV.io HD device will now properly display.

- When AV.io HD is connected to the video source and capture computer on Windows 7, the AV.io Config tool sometimes does not display AV.io HD on the device list despite showing up as an installed device on the computer's Device Manager.

  Workaround: Use AV.io Config on a different supported OS to configure AV.io HD. Firmware updates and configuration changes will be saved to the device. (Note that the AV.io HD device still functions with the selected capture application on the original Windows 7 workstation despite possible issues with the AV.io Config tool.)

- Plugging in AV.io HD to a USB 3.0 port on Windows 8.1 causes the Windows Device Setup window to freeze.

  Workaround: Close and ignore the frozen Device Setup window; AV.io HD is installed and available for use.

- On Windows 8.1/10, streaming is not possible when the capture computer with an ASMedia ASM1042A USB 3.0 controller recovers from sleep mode.

  In this scenario, AV.io HD is connected to both the capture computer and video source. Streaming is initiated through the application, then stopped. The computer is then put in sleep mode, and upon recovering from sleep, streaming cannot be resumed. This only occurs when using a capture computer with an ASMedia ASM1042A USB 3.0 controller.

  Workaround: Connect to a different USB 3.0 controller. Use the lsusb command to list all USB devices and connect to a different USB 3.0 controller that is not ASMedia.

- Using Chromebook Apps (Clipchamp) and WebRTC on Google Chrome OS v 43.0.2357.125 (64 bit), AV.io HD is not detected as a valid audio device.

  Workaround: Use Clipchamp and WebRTC for capturing video only, or use a different Chromebook app to capture both video and audio.

- In Ubuntu 14.04 LTS, the very first frame is always green in all streaming attempts (with the exception of the first streaming attempt after device boot).

  Workaround: Remove the green frame in post-production editing. If streaming, begin stream after the initial green frame as already been captured.

- Disconnecting and reconnecting the USB 3.0 cable on an AV.io HD device with an HDMI splitter causes video capture to become nonfunctional.

    Workaround: Avoid using a splitter. If a splitter is necessary, disconnect then reconnect USB 3.0 cable from capture computer before reconnecting cable to AV.io HD.

Getting started

Welcome and thank you for buying Epiphan's AV.io HD!

This guide contains all the information necessary to successfully use AV.io HD to quickly and easily capture live video content without any configuration – simply connect the cables and you're ready to go!

We'll start off by jumping right into it by showing you how to start capturing video, then we'll take you through how AV.io HD works, followed with some technical reference material, and we'll conclude with a walkthrough of some optional video capture configuration.

Let's get started!

Contents of the kit

Your Epiphan AV.io HD product contains everything you need to easily capture live video content with minimal setup. Your purchase includes the following:

AV.io HD video grabber		Your video capture device!
DVI to VGA cable		Connects a video source with a VGA port to your AV.io HD's DVI port. This cable is included with your AV.io HD purchase.
DVI single link cable (3 feet)		Connects a DVI source to your AV.io HD's DVI port.

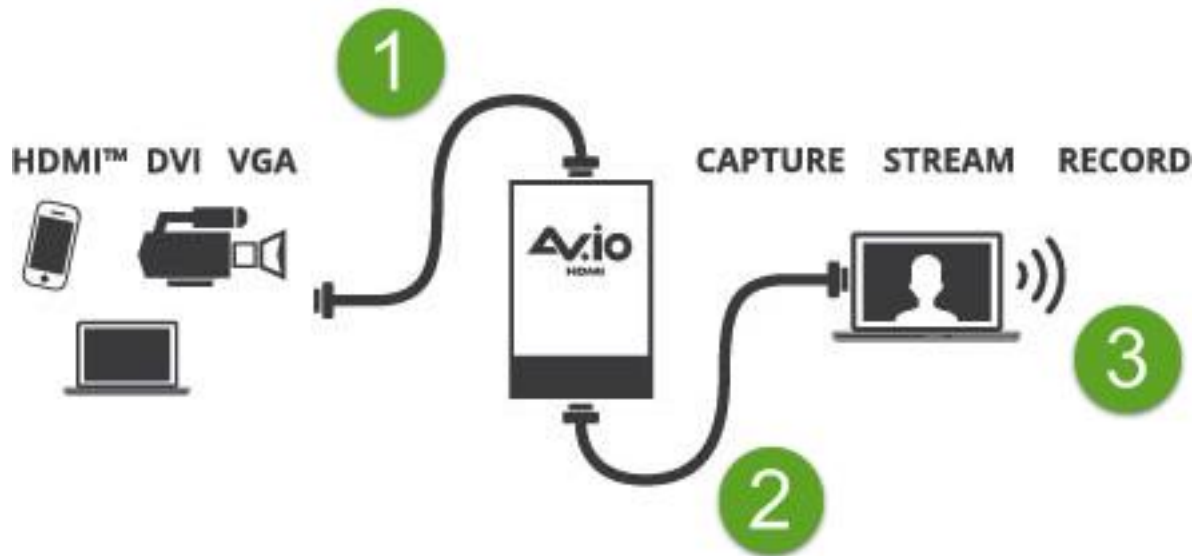| **HDMI to DVI adapter**		Connects an HDMI source to your AV.io HD's DVI port
USB 3.0 cable (1 meter)		The USB 3.0 cable connects your AV.io HD video grabber with your desktop computer, laptop or notebook's USB 3.0 or 2.0 port.

System requirements

System requirements are the barebones technical essentials your computer needs to work with AV.io HD. System requirements to use AV.io HD include:

Video source	Any VESA-compatible VGA, DVI or HDMI source. (AV.io HD cannot capture from an HDCP encrypted source)
Video capture workstation	Any computer (laptop/desktop/other format) with: • a compatible USB 3.0 host controller for SuperSpeed operation; • or a USB 2.0 controller
Video capture workstation operating system	Windows 7, Windows 8.1, Windows 10 Mac OS X 10.10 and up Linux distribution with kernel 3.5.0 or higher
Processor frequency	Minimum recommended value: 2.4 GHz
RAM	Minimum recommended value: 4 GB

Capturing live video content

Setting up your AV.io HD device to capture live video content couldn't be easier!

1. Connect your AV.io HD device to your video source

2. Connect your AV.io HD device to your desktop computer, laptop or notebook

3. Open your favourite built-in or third-party application, select AV.io HD from the list of available cameras and start capturing!

And that's it! No drivers to install and no extensive set-up! Just connect the cables and you're ready to go!

How AV.io HD works

Once you're ready to start capturing, you'll need either a built-in or third-party application to capture video content with AV.io HD. The application will communicate with AV.io HD and negotiate a **frame rate** (frequency at which frames in a video sequence are displayed) and **frame size** (size of a single video frame in pixels).

Resolutions and capture rates

The display resolution or display modes of a TV, computer monitor or display device is the number of distinct pixels in each dimension that can be displayed.

AV.io HD generates a list of the following possible resolutions for your capture application to select for output display:

640×360	**848×480**	**1024×768**	**1280×1024**	**1920×1080**
640×480	**960×540**	**1280×720**	**1600×1200**	**1920×1200**

Captured video content outputs to your application at **15, 30 or 60 frames per second**.

Aspect ratios

The aspect ratio of an image describes the proportional relationship between its pixel width and height. AV.io HD outputs resolutions in many commonly supported aspects ratios, color-coded according to table of resolutions above and described in the table below:

4:3	**16:9**	**16:10 (8:5)**	**5:4**

Aspect Ratio	Common Use
4:3	Standard letterbox TV display and non-widescreen computer displays
16:9	Widescreen (HD) TV displays (1080p, 1080i, 720p etc)
16:10 (8:5)	Widescreen computer displays
5:4	Sometimes used in larger format computer monitors

Automatic image scaling & audio resampling

If your source content is larger or smaller than the frame size chosen by the application, AV.io HD automatically **scales your source** to match the desired frame size! No user configuration required!

Av.io HD also automatically performs **audio resampling**, meaning that no matter the bit depth or frequency of audio through an HDMI audio source, AV.io HD automatically resamples your audio so that your application gets a consistent audio sample rate and bit depth, even if you change the video source!

Third-party applications

Once your AV.io HD is connected and ready to go, you can now begin capturing live video content via any UVC-compatible third-party application. These third-party applications include, but are not limited to:

Zero install applications (included with your OS)		
Skype (with Windows 8.1)	**Quicktime** (with Mac OS X)	**Windows Camera App** (with Windows 8.1)

Popular applications available for download				
Skype	**Wirecast**	**Adobe FMLE**	**VLC media player**	**Quicktime**

Physical features

Your AV.io HD device includes two inputs and an indicator light.

Inputs and indicator lights are identified in the top and bottom cap view AV.io HD images below. Inputs are explained in the images, and the indicator light details are explained in the proceeding table.
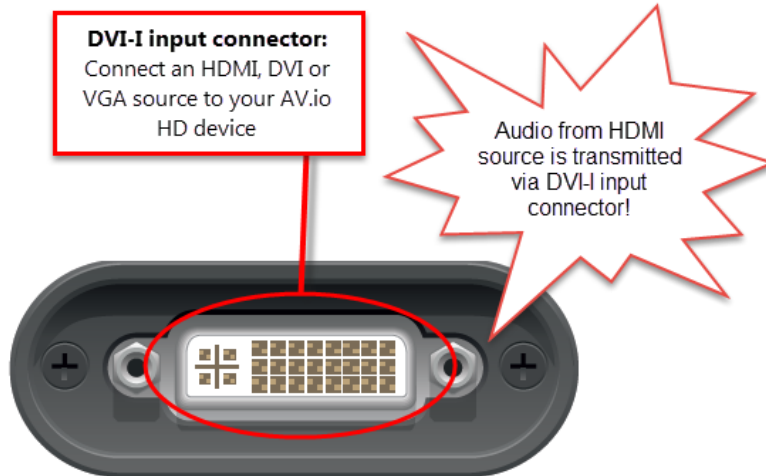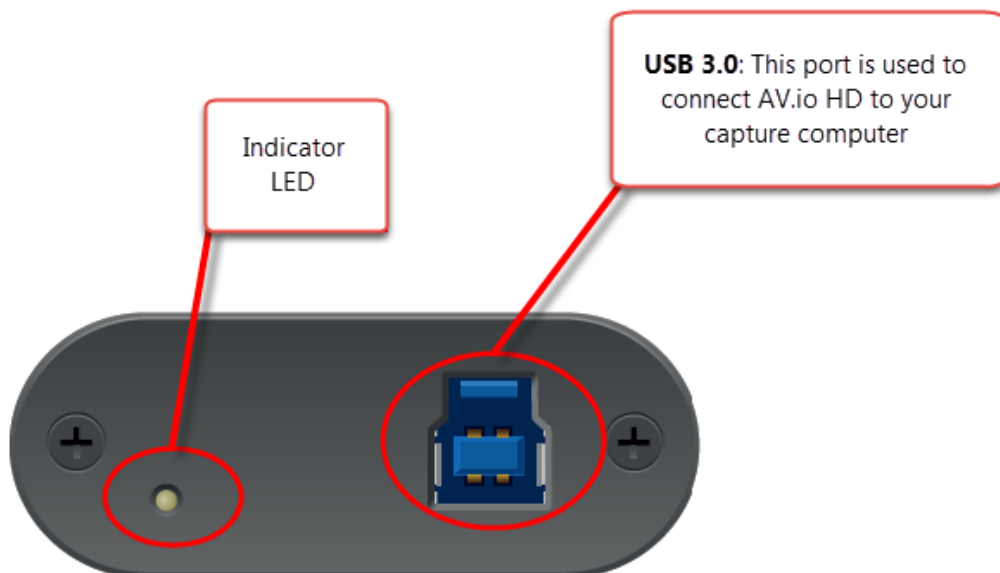
Figure 1 – AV.io HD top cap view

DVI-I input connector:
Connect an HDMI, DVI or VGA source to your AV.io HD device

Audio from HDMI source is transmitted via DVI-I input connector!

Figure 2 – AV.io HD bottom cap view

Indicator LED

USB 3.0: This port is used to connect AV.io HD to your capture computer

Indicator LED details

The color and action of the indicator LED depends on whether you are connected by USB 3.0 or USB 2.0. For maximum performance, always use a USB 3.0 port and the included USB 3.0 cable. Note that frame capture rate will be reduced when connected via USB 2.0.

If you're not sure if your controller is USB 3.0 or USB 2.0, plug AV.io HD into the capture computer and look at the indicator LED:

A **solid blue LED means USB 3.0 and...**   a **solid green LED means USB 2.0**

Connection type/LED color	USB 3.0 connection	USB 2.0 connection
Solid red	• Firmware update in progress • AV.io HD initializing	• Firmware update in progress • AV.io initializing
Blinking red	Adjustment to VGA input in progress	Adjustment to VGA input in progress
Solid green	–	USB 2.0 connection active
USB 3.0 (solid blue) or USB 2.0 (solid green) begins blinking only green	Audio transferring successfully	Video transferring successfully
Solid blue	USB 3.0 connection active	–
USB 3.0 (solid blue) or USB 2.0 (solid green) begins blinking only blue	Video transferring successfully	Audio transferring successfully
USB 3.0 (solid blue), now blinking green and blue	Video and audio transferring successfully	–
USB 2.0 (solid green), now blinking blue and green	–	Video and audio transferring successfully

Technical specifications

Connectors	DVI-I (digital and analog) USB standard B type
Input	HDMI (audio compatible) VGA and DVI
Audio (HDMI) Input	16-bit and 24-bit PCM encoded audio at 32 kHz, 44.1 kHz and 48 kHz sampling rates
Audio (UAC) output	16-bit 48 kHz stereo audio sampling rates
Color space	YUV 4:2:2
Supported output resolutions (at 15, 30 or 60 fps capture rate)	640×360 640×480 848×480 960×540 1024×768 1280×720 1280×1024 1600×1200 1920×1080 1920×1200
Capture delay	Near-zero latency, although certain third-party applications may contribute to delay
OS support (32-bit and 64-bit)	Windows 7, Windows 8.1, Windows 10 Mac OS X 10.10 and up Linux distribution with kernel 3.5.0 or higher
USB support	USB 3.0 and 2.0

Optional configuration

Your AV.io HD device is ready to use right out of the box; however, there is support for additional configuration should you need it. Changes can be made to your AV.io HD's default settings through Epiphan's AV.io Config tool.

The AV.io Config tool allows you to change several settings to make changes to your video capture experience if necessary. Most user's won't need to use this utility for anything other than firmware update, but advanced users may find these tweaks help them get the most out of their AV.io HD.

These settings include:

- use input signal resolution;
- aspect ratio preservation; and,
- performance mode

Input signal resolution

When enabled, your AV.io HD adds the exact resolution of your input signal to the list of supported output resolutions. This is the only way to enable 1:1 capture for special frame sizes. However it is important to note that the capture resolution as dictated by the third-party application will override any AV.io HD custom capture settings. Also note that in selecting this mode, any change in input signal (programmatic or by connecting a different input) causes AV.io HD to renegotiate its resolution with the application. This can cause an interruption in the captured stream.

Preserve aspect ratio

When enabled, your AV.io HD preserves the aspect ratio of your input signal by adding black bars to the sides or top and bottom of the frame if the application using the signal requests a frame size with a different aspect ratio. For example, with this option enabled, a 4:3 input signal gets black bars added to the sides of the image when viewed in an application that requests a 16:9 aspect ratio. With this option disabled, the 4:3 image is instead stretched to fit the full 16:9 size.

Performance mode

When enabled, your AV.io HD enters and exits system suspend mode (i.e. sleep) faster by disabling support for the Suspend/U3 USB power state. This means AV.io starts working again faster after your computer wakes from a system suspend state, at the cost of increased power consumption. Disabling this setting is ideal in situations where power consumption needs to be monitored, such as battery preservation in laptops.

Changing the configurable settings using the AV.io Config tool

Epiphan's AV.io Config tool allows a more advanced user the ability to change several settings to their video capture experience. The settings that can be changed include: Re-numerate input signal resolution, aspect ratio preservation and performance mode.

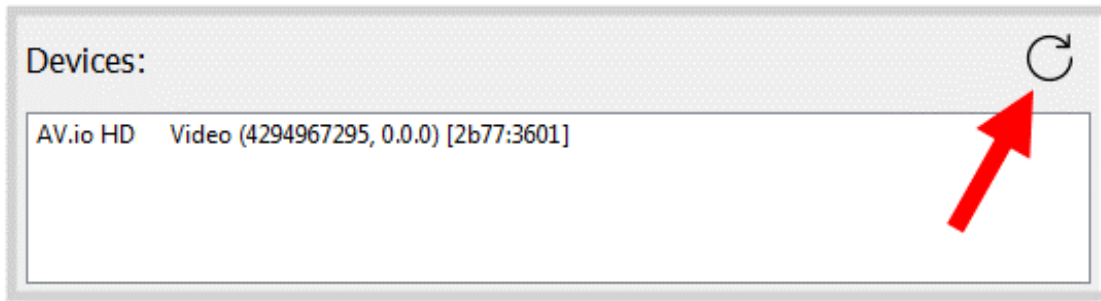## To change the configurable settings using the AV.io Config tool

1. Connect your AV.io HD device to your computer, laptop or notebook.

2. Download the AV.io Config tool from the Av.io Drivers section of Epiphan's web site (http://www.epiphan.com/support/avio-hd-drivers-documentation/)
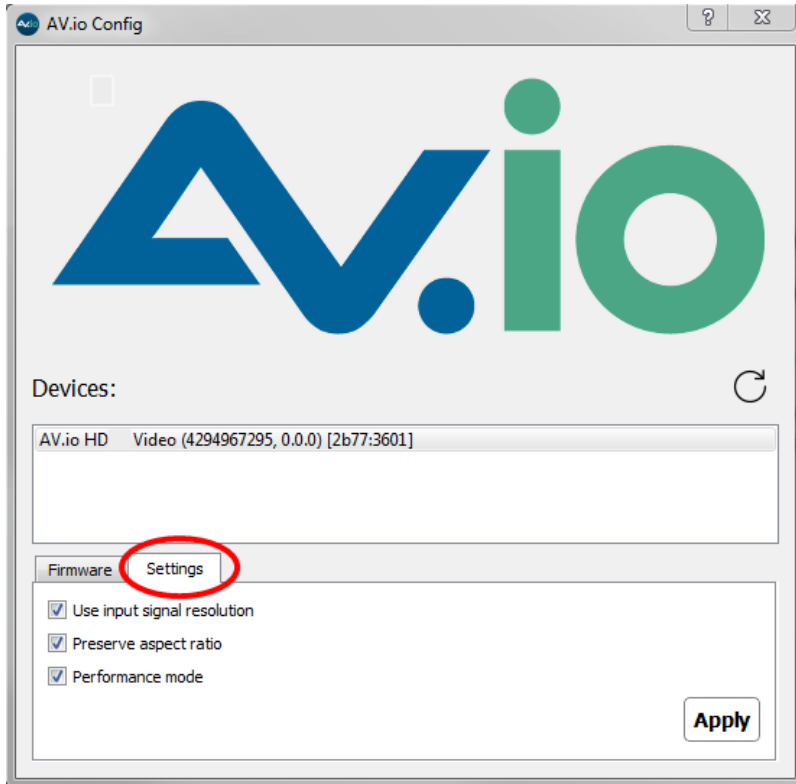
3. Open the AV.io Config tool.

4. Select your AV.io HD device from the list under the Devices heading.

If your AV.io HD device is not displayed, press the Refresh icon to refresh the list of connected devices.

5. Click the **Settings** tab; the setting page appears.

6. Enable or disable the settings by clicking each setting's checkbox accordingly.

7. Click **Apply.**

To update the firmware using the AV.io Config tool

From time-to-time Epiphan Video releases firmware updates for our video grabbers. If you register your product and agree to be notified of product updates, you'll receive an email when there is an AV.io HD update available for download.

Do not attempt to update firmware while running virtual machines – doing so will result in firmware upgrade failure.
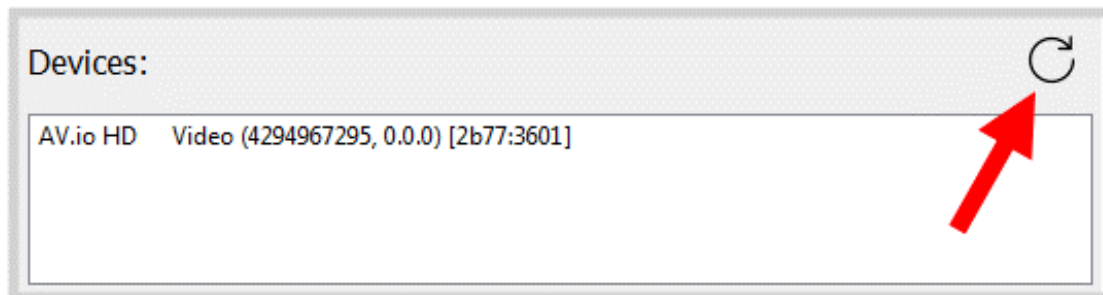
1. Download the firmware update file from the Epiphan website, as described in your firmware update notification email.

2. Connect your AV.io HD device to your computer, laptop or notebook.

3. Download the AV.io Config tool from the Av.io Drivers section of Epiphan's web site (http://www.epiphan.com/support/avio-hd-drivers-documentation/)

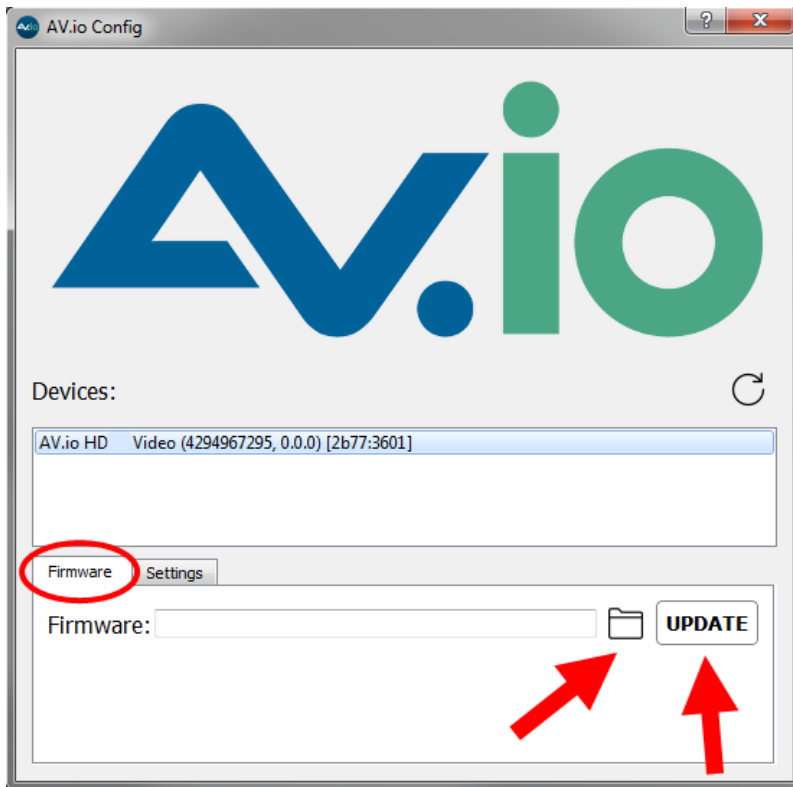4. Open the AV.io Config tool.

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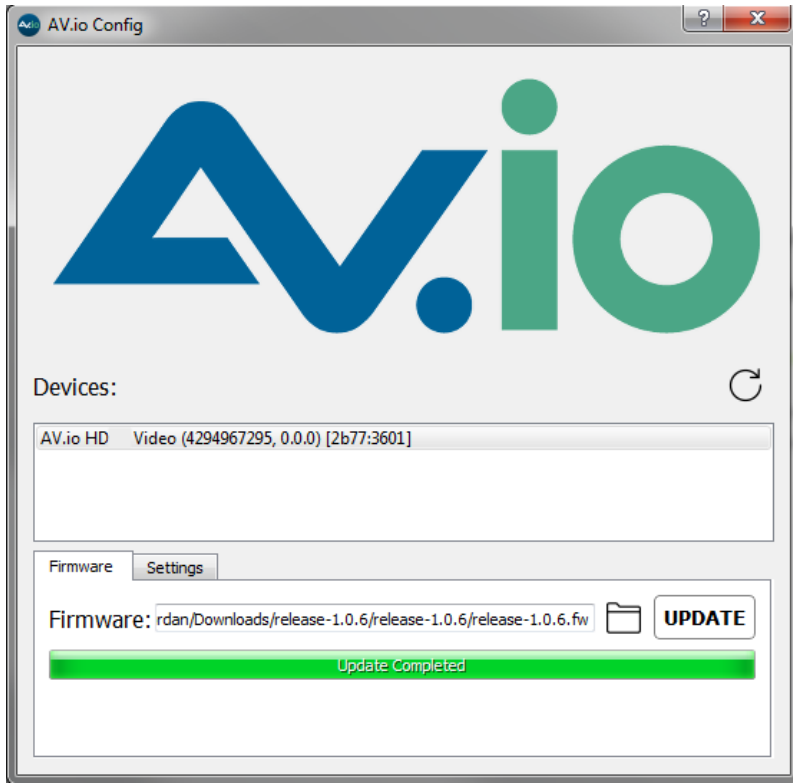

6. Click the **Firmware** tab.

7. Click the **Folder** icon to navigate to the saved location of the firmware, and click **Update** to update your AV.io HD unit to the selected firmware. An update bar will appear which will display the progress of the update.

Do not disconnect your AV.io HD at any point during the update process! Doing so may cause irrevocable errors and/or permanently damage the device.

8. When the update is finished the progress bar will turn green and display "Update Completed". You may now safely disconnect your AV.io HD if needed.

When updating firmware on a Mac, "Update Completed" text will not be displayed. The firmware upgrade is complete when the progress bar fills the width of the AV.io Config window and the window contents are no longer greyed out.

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March 28, 2014

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The equipment that you bought has required the extraction and use of natural resources for its production. It may contain hazardous substances that could impact health and the environment.

In order to avoid the dissemination of those substances in our environment and to diminish the pressure on the natural resources, we encourage you to use the appropriate take-back systems. Those systems will reuse or recycle most of the materials of your end life equipment in a sound way.

The crossed-out wheeled bin symbol invites you to use those systems. If you need more information about collection, reuse and recycling systems, please contact your local or regional waste administration. You can also contact us for more information on the environmental performance of our products.

FCC and CE Compliance Statement

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

1. This device may not cause harmful interference

2. This device must accept any interference received, including interference that may cause undesired operation.

Marking by the symbol $C\epsilon$ indicates compliance of this device with EMC directive of the European Community and meets or exceeds the following technical standard.

EN 55022 - Limits and Methods of Measurement of Radio Interference Characteristics of Information Technology Equipment.

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